

[0005]

Sending map information by e-mail is considered one of the effective uses of map information. In other words, a user sends map information displayed as a result of searching to a desired recipient via e-mail. The recipient opens the mail, displays the map information contained in the mail on a terminal, and confirms the contents. For example, sending map information around home areas or meeting places to a recipient enables easy and accurate communication of geographic information by displaying the map.

[0011]

According to a system thus configured, the user at a sender terminal acquires map image data of a desired point by connecting to the map information providing system. When a handwriting input is entered to the acquired map image data, map image information with a hand-written input is created as new image data. In addition, the user enters any text data. Then, the sender terminal sends the map image data with the handwritten input and the text data to the mail server of the recipient as e-mail information.

[0016]

According to Claim 6, the process for sending e-mail from a sender terminal to the mail server of a recipient within a system containing the sender terminal and the map information providing system connecting to network respectively includes:

- a step which acquires map image data by connecting to said map information provision system;

- a step to enter handwriting input onto said acquired map image data, creating map image data with the handwritten input;

- a step to enter any text data; and

- a step to send said map image data with the handwritten input and said text data to said recipient's mail server as e-mail information.

[0020]

[1] System configuration

FIG. 1 illustrates the e-mail system in schematic view in accordance with an embodiment of the present invention. In FIG. 1, a map database center 10 and a map information provision site 20 are connected to the Internet 5. In addition, a terminal A and a terminal B are connected to the Internet 5.

[0021]

The map database center 10 is the central point for implementing services to search and display maps on the Internet, and is equipped with a map server 12 and a map database 14. The map database 14 contains positional information (coordinate information) on maps, for example, information about latitude and longitude, and image data of map information corresponding to the positional information. The image data of the map information is configured as multiple hierarchy structures in a reduced scale. In other words, image data for multiple reduced scales, such as a map of all of Japan and maps of each prefecture, and a map file name to specify the image data is marked, respectively. The reduced scale information corresponds to the map files.

[0022]

The map server 12 searches and acquires the image data of the corresponding map information from the map database 14 as designated or instructed from the user terminal, and sends the data to the user terminal via the Internet 5. Moreover, the map server 12 also searches and sends map information according to a request from the WWW server.

[0023]

The map information provision site 20 is a WWW site. WWW is the Wide Area Information System on the Internet providing multimedia information, such as text information, image information and audio information, by using hypertext. The WWW server is a server on the Internet linked by WWW, and a site providing a service by WWW is referred to as a WWW site. The map information provision site 20 is equipped with the WWW server 22 and a landmark database 24.

[0024]

The landmark database 24 stores certain addresses, the names of train stations and landmarks (such as facilities, recreation halls and stores) and other data indicating correspondence with information about the positional information. Therefore, the WWW server 22 can specify the corresponding address, name of a train station and landmark from specific positional information by accessing the landmark database 24. Conversely, corresponding positional information can also be acquired from a specific address, name of a station or a landmark name.

[0025]

The terminals A and B are user terminals which can receive the WWW service by using an application program referred to as a WWW browser. In the example of FIG. 1, terminals A and B are connected to the map information provision site 20 by using the WWW browser, and browsing the homepage enables the reception of the map information providing service.

[0026]

#### [2] Basic operation for providing map information

A basic operation for providing the map information will be described as follows with reference to FIGS. 2 to 4. FIG. 2 is a flowchart of providing map information, and FIGS. 3 and 4 are examples of a map display screen in each step. An example will be explained as to how a user A of the terminal A acquires map information by connecting to the map information site.

[0041]

#### [3] e-mail sending process

The e-mail sending process according to the present invention will be explained as follows with reference to FIGS. 5 to 7. FIG. 5 is a flowchart showing the e-mail sending process. FIGS. 6 and 7 show examples of a message composition screen displayed on the terminal in the e-mail sending process.

[0042]

A case will be explained as follows as to how the user A at the terminal A sends an e-mail with map information according to the present invention to a user B at the terminal B. It is assumed that the user A is connected to the map information site. To begin with, the user A displays a map image which he or she desires to send to the user B, on the terminal A by using pre-described procedures (Step S20). This is conducted by a method which will be explained hereafter with reference to the flowchart in FIG. 2. In other words, on the web page of the map information site displayed on the terminal A, entries of the address and name of a train station result in the display of the map information of a desired place on a map display 30. If necessary, a more appropriate reduced scale can be selected by clicking the button within a reduced scale designator 32.

[0043]

The user A clicks a mail processing button 38 (Step S22) in the next place, and the terminal A sends positional information of the currently displayed map image (a center position of the display), size information and reduced scale information to the WWW server 22 comprising the linked URL of said HTML text (Step S24). The WWW server 22 sends the data to the map server 12 (Step S26), which refers to the map database 14, selects a map file based upon the reduced scale information, and acquires a map image within a range to be determined according to the positional information and the size information. The map image is sent to the WWW server 22 as GIF data (Step S28). The WWW server 22 stores the map image data with a file name (for example, "Image C").

[0044]

The WWW server 22 creates HTML texts containing the file name of the image data ("Image C") in the next place, the positional information, the reduced scale information and a description of the title of contouring program (JAVA applet) to be used for handwriting input at the terminal A, and sends them to the terminal A (Step S30).

[0045]

The terminal A receives the HTML texts sent from the WWW server 22 and reads the contents. Moreover, the terminal A requests the program with the title described therein from the WWW server 22, and downloads the program (Step S32).

[0046]

The terminal A acquires the file name, the positional information, and the reduced scale information of the map image data in the next place from the HTML texts, and further acquires the map image file, to be displayed, from the WWW server. In addition, the downloaded contouring program is started, resulting in the mail generating screen 40 as shown in FIG. 6, which appears on the terminal A (Step S34).

[0047]

In a manner similar to normal e-mail software, an address entry box 46, a subject entry box 48 and a message entry box 50 are displayed on the e-mail-generating screen 40. Therefore, the user A enters the mail address, the subject, and message of a recipient into the entry boxes using a keyboard.

[0048]

In addition to this, on the mail generating screen 40, the previously determined map image is displayed within the map display 42. The user A can confirm a map image to be sent to the recipient along with the currently-generating e-mail.

[0049]

A handwriting input tool 44 is displayed under the map display 42. It is a significant advantage of the present invention that arbitrary handwriting can be input onto a map image to be sent. In other words, not only can a mail sender send an e-mail with a map image, but also the mail sender can enter any handwritten into the map image and send the e-mail having the map image into which the handwritten character has been input.

[0050]

The user A composes a mail on the mail-generating screen 40 (Step S34). For example, it is assumed that the user A sends an e-mail regarding a meeting with the user B. In this case, the user A enters the user B's mail address in the address entry box 46, and enters a subject and a message into a subject entry box 48 and the message entry box 50, respectively. For example, "Meeting on March 3<sup>rd</sup>" is entered as a subject, and a message is entered in the message box that "I am waiting for you at ○○ Burger at the West Gate of JR Kamata Station at 7 PM on March 3<sup>rd</sup>. Please see the attached map."

[0051]

Next, the user A enters a handwritten characters into the map image displayed within the map display 42 using the handwriting input tool 44. In other words, as shown in FIG. 7, a line is drawn indicating the direction from Kamata station of JR (Japan Railway Corporation) to ○○ Burger, and the ○○ Burger is circled. When the handwriting input is completed, the user A clicks a send button 52. This results in the determination of the generated mail text and the map information. Furthermore, if the user A wishes to re-designate the map image or to terminate the e-mail sending, the display on the terminal A is returned to the main screen shown in FIG. 4 by clicking a reset button 52.

[0052]

When the send button 52 is pressed, the contouring program within the terminal A converts the map image having the handwritten characters incorporated therein by the user A into a GIF format image. The terminal A sends the converted map image data and other data, such as the entered recipient's e-mail address, subject and message, to the WWW server 22 (Step A36). The WWW server 22 stores the received map image data, and sends the mail information to the recipient's e-mail address (Step S38).

[0053]

The user B receives the mail and displays it on the terminal B. The mail has the map image data (the image on the map display 42 shown in FIG. 7) having the

handwritten characters superimposed by the user A. The user B can view the map image along with the message. As described, the map image including the handwritten input is sent as an e-mail.

[0054]

In the aforementioned embodiment, an e-mail sender downloads a contouring program, for entering the handwritten characters onto a map image, from the WWW server, such as JAVA applet, to a terminal of the e-mail sender. Instead, it is also possible to configure to covert handwritten characters and a map image having the superimposed handwritten characters into data using contouring software preinstalled in each terminal. The reason the JAVA applet is used in the present embodiment is because drawing software having appropriate compatibility to each terminal may not always exist and there are security problems.

[0055]

As described above, according to the present invention, the map image having handwritten characters superimposed by the sender can be sent to a recipient along with a normal message as e-mail. Therefore, it becomes possible to easily communicate more accurate information to a recipient based on the map information.